

## **REMARKS**

The Applicants respectfully request reconsideration of this Application in view of the following remarks. The Applicants originally submitted Claims 1-20 in the Application. Pursuant to a restriction requirement, the Applicants previously canceled Claims 16-20 without prejudice or disclaimer. The Applicants also previously added Claim 21. In response to the present Office Action, the Claims have not been amended. Accordingly, Claims 1-15 and 21 are currently pending in the Application.

### **I. Rejection of Claims 10 and 14 under 35 U.S.C. §102**

The Examiner has rejected Claims 10 and 14 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,329,722 to Shih *et al.* ("Shih"). Shih, however, fails to teach encapsulating the bond pad with a homogenous metal passivation layer, as recited in Claim 10. Rather, Shih's FIGURES 4A-4B depicts a copper layer 310 whose upper surface contacts both a copper/tin alloy 420 and a protective overcoat 360 made of silicon oxide or silicon nitride (Column 4, Lines 24-26). Thus, Shih's copper/tin alloy 420 does not encapsulate the copper layer 310, and as such, it fails to disclose each and every element of Claim 10. Therefore, Shih fails to anticipate Claim 10 and its dependent Claims, including Claim 14. Consequently, the Applicants request the Examiner withdraw the §102 rejection of Claims 10 and 14.

### **II. Rejection of Claims 1-9, 11-13, 15 and 21 under 35 U.S.C. §103**

The Examiner has rejected Claims 1-9, 11-13, 15 and 21 under 35 U.S.C. §103(a) as being unpatentable over Shih in view of U.S. Patent No. 6,187,680 to Costrini, *et al.* ("Costrini") and

Electronic Packaging and Interconnection Handbook, by Harper ("Harper"). The Applicants respectfully disagree.

For instance, the combination of Shih, Costrini and Harper fails to teach or suggest that the tantalum (Ta) layer encapsulating the copper (Cu) bond pad, as recited in Claim 1. As discussed above, Shih depicts a copper layer that is only partially covered by a copper/tin alloy. Nor can the Applicants find any suggestion in Shih of a Ta layer encapsulating a copper bond pad. Moreover, as pointed out in the response mailed May 27, 2003, Costrini does not disclose encapsulating a bond pad with a Ta passivation layer. Similar to Shih, Costrini depicts a copper wire 22 partially covered by a barrier layer 28 that could contain TaN or Ta and a passivation layer 24 made of SiO<sub>2</sub> or Si<sub>3</sub>N<sub>4</sub>, (FIGURE 2(d)).

Additionally, the asserted combination of Shih in view of Costrini and Harper fails to establish a *prima facie* case of obviousness because the asserted combination of references is improper. The combination of Shih with Costrini is improper because a person having ordinary skill in the art would not be motivated to replace Shih's tin cap with Costrini's barrier layer. For instance, Shih use tin because it is malleable and because low temperature, or only ultrasonic energy, can be used for wire bonding (Column 5, Lines 35-62) and Shih provides a list of suitable alternative materials that provide bondable surfaces other than tin, which are zinc, lead, and indium (Column 6, Lines 13-16). There is no teaching or suggestion in the asserted combination that Ta would perform in a similar fashion and to suggest that TA could be substituted for tin is nothing short of using the present application to provide the missing motivation. This of course is the use of hindsight which is impermissible under case law . The Applicants therefore respectfully submit that

going beyond the list of materials named by Shih requires the improper hindsight from the teachings of the present invention.

Accordingly, the combination of Shih, Costrini and Harper both fails to teach or suggest each and every element recited in independent Claims 1 and 10 of the present application, and is an improper combination. Therefore, the combination fails to support a *prima facie* case of obviousness with respect to Claims 1 and 10 and their dependent claims. Hence, Claims 1-9, 11-13, 15 and 21 are not obvious in view of any combination of Shih, Costrini and Harper. The Applicants therefore requests that the Examiner withdraw the §103 rejection of the these claims.

### **III. Conclusion**

In view of the foregoing remarks, the Applicants continue to see all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicit a timely Notice of Allowance for Claims 1-15 and 21.

The Applicants request the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application.

Respectfully submitted,

**HITT GAINES, P.C.**

A handwritten signature in black ink, appearing to read "Charles W. Gaines", written in a cursive style.

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Dated: 11/10/03

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